

WHAT I CLAIM AS MY INVENTION:

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1. An interposer assembly for forming redundant electrical connections with contact pads on substrates positioned above and below the assembly, said assembly comprising:

a) an insulating plate having top and bottom sides and a plurality of passages extending through the thickness of the plate; and

b) a plurality of metal contacts, each contact disposed in one of said passages, each contact including a first pair of spaced contact points at the top side of the plate, a second pair of spaced contact points at the bottom side of the plate, and a spring portion extending between said first pair of contact points and said second pair of contact points, said spring portion spacing said pairs of contact points apart a distance greater than the thickness of the plate when the spring portion is unstressed, wherein each pair of contact points forms redundant electrical connections with a contact pad on a substrate.

2. The assembly as in claim 1 wherein in each contact the contact points of each pair of contact points are spaced laterally across the contact.

3. The assembly as in claim 2 wherein each contact point comprises a rounded corner.

4. The assembly as in claim 3 wherein each contact is formed from uniform thickness strip stock having a sheared circumferential edge, and each contact point is located on a corner of said circumferential edge.

5. The assembly as in claim 4 wherein each spring portion includes a central portion and a pair of beams, each beam located between the central portion and a pair of contact points, said beams elastically bendable into said passages.

6. The assembly as in claim 5 wherein each contact point is bent to one side of a beam.

7. The assembly as in claim 6 wherein each contact point is rounded along the length of the edge corner.

8. The assembly as in claim 7 wherein said strip stock has a thickness of about 0.0017 inches.

9. The assembly as in claim 7 wherein said rounded corners have a transverse radius of curvature of about 0.0006 to 0.0010 inches.

10. The assembly as in claim 7 wherein each contact is symmetrical to either side of the central portion.

11. The assembly as in claim 10 wherein the plate includes a projection extending into each passage, and each contact includes two retention portions located on opposite sides of a projection to retain the contact in the passage.

12. The assembly as in claim 1 wherein each contact includes opposed sheared edges, each contact point comprising a shear rounded edge corner.

13. The assembly as in claim 12 wherein each contact point comprises a bent projection.

14. An assembly adapted to be interposed between pairs of spaced metallic pads on substrates for forming electrical

connections between the pads, said assembly comprising:

a) a dielectric plate having a top and a bottom, a plurality of spaced passages extending through the thickness of the plate from said top to said bottom thereof, said passages each including opposed interior walls,

b) a projection in each passage, each projection extending outwardly from one of said interior walls toward an opposed interior wall and including a first surface facing said plate top and a second surface facing said plate bottom;

c) a plurality of metal contacts, each contact disposed in one of said passages, each contact formed from thin sheet metal stock and including a central portion, a pair of beams extending to either side of the central portion, a nose located on the end of each beam, and a retention leg extending inwardly from each nose to an end located away from the central portion, said noses spaced apart a distance greater than the thickness of the plate when the contact is unstressed, each contact being located in a passage with the central portion adjacent an interior wall away from the passage projection and the ends of the retention legs located on opposite sides of the projection so that the projection retains the contact in the passage; and

d) each contact including a pair of laterally spaced contact points adjacent each contact nose;

e) wherein upon compression of the contacts into the passages by opposed contact pads, the beams are stressed, and the contact points on each nose engage and wipe along a pad to form redundant

wiped pressure connections with the pad.

15. The assembly as in claim 14 wherein said beams are curved.

16. The assembly as in claim 15 wherein each contact point is located on an edge of a beam adjacent a nose.

17. The assembly as in claim 16 wherein each contact point is located at a corner of a beam edge.

18. The assembly as in claim 16 wherein each contact point comprises a shear-wiped corner of a beam edge.

19. The assembly as in claim 18 wherein said strip stock has a thickness of about 0.0017 inch.

20. The assembly as in claim 19 wherein said contact points are rounded and have a radius of curvature of about 0.006 inches.

21. The assembly as in claim 18 wherein each contact point comprises a portion of a contact bent to one side of the remainder of the contact.

22. The assembly as in claim 15 wherein said beams are tapered.

23. The assembly as in claim 22 wherein said retention legs are tapered.

24. A spring contact for forming redundant electrical connections with a contact pad, said spring contact comprising an elongate metal body including a mounting end, a contact end and a resilient beam located between such ends, the beam extending laterally away from the mounting end to locate the contact end to one side of the mounting end, said contact end including a pair of

contact points spaced across the contact end, wherein movement of a contact pad into engagement with contact points flexes the beam and wipes the contact points along the pad to form redundant pressure electrical connections between the contact and pad.

25. The spring contact as in claim 24 wherein each contact point comprises a rounded edge.

26. The spring contact as in claim 25 wherein the spring contact is formed from uniform thickness strip stock having a sheared circumferential edge, and each contact point is located on a corner of said circumferential edge.

27. The spring contact as in claim 26 wherein each contact point is bent to one side of the contact ends.

28. The spring contact as in claim 27 wherein each contact point is rounded along the length of the edge corner.

29. An interposer assembly for forming redundant electrical connections with contact pads on substrates positioned above and below the assembly, said assembly comprising:

a) an insulating plate having top and bottom sides and a plurality of passages extending through the thickness of the plate; and

b) a plurality of metal contacts, each contact disposed in one of said passages, each metal contact comprising an integral body formed from uniform thickness strip stock and including a first spring contact as in claim 24 and a second spring contact as in claim 24, each metal contact including a central portion joining the mounting portions of said spring contacts, the contact portions

of said spring contacts facing outwardly of the passage at the top and bottom thereof, the contact portions spaced apart a distance greater than the thickness of the plate when the metal contact is unstressed, wherein the contact points on each contact end form redundant electrical connections with a contact pad on a substrate.

30. An interposer assembly as in claim 29 wherein said beams are curved.

31. An interposer assembly as in claim 30 wherein each contact point comprises a rounded corner.

32. An interposer assembly as in claim 31 wherein each rounded corner is located on a sheared edge of the metal contact.

33. An interposer assembly as in claim 32 wherein each contact point is bent up from one side of a contact end.

34. An interposer assembly as in claim 33 wherein each contact point is rounded along the length of the edge corner.

35. The method of making a spring contact for forming redundant electrical connections with a contact pad, comprising the steps of:

a) cutting a preform from a strip of uniform thickness metal stock to form a preform having a circumferential edge and edge corners;

b) rounding one edge corner to form a pair of adjacent contact surfaces; and

c) bending the preform to locate the contact surfaces to one side of the preform to form two spaced apart contact points.

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37. The method of ~~claim 35~~ including the step of:

e) rounding the edge corners of said contact points along the lengths thereof.